

French original of the letter comes from ASN website:

(<http://www.asn.fr/sections/infos-locales/reacteur-epr/flamanville-epr-controle-asn/sections/acces-lettre-suite/?Installation=107&libel=R%E9acteur%20EPR%20de%20Flamanville>)

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Hérouville-Saint-Clair, 12 March 2008

N/Ref: Dep- CAEN-No.0185-2008

Director of Development, Flamanville 3

BP28

50340 FLAMANVILLE

SUBJECT: Inspection of major nuclear installations.

Inspection no. INS-2008-EDFFA3-0012 of 5 March 2008

Dear Director

In the context of the responsibilities of the Nuclear Safety Authority (NSA) regarding the inspection of major nuclear installations, as set out in Article 40 of law no. 2006-686 of 13 June 2006 relating to nuclear transparency and security, a scheduled inspection took place on 5 March 2008 on the construction site of the Flamanville 3 reactor, focusing on civil engineering issues.

I have the honour to present to you below a summary of the inspection as well as the main demands and observations resulting from it.

Summary of the inspection

The inspection of 5 March 2008 concerned the preparation for the concreting of plot no.2 of the foundation raft for the nuclear island. This plot corresponds to the area of the nuclear island raft located under the future fuel storage building (HK) of the Flamanville 3 reactor.

This close inspection concluded that the organisation specified and implemented on site for the preparation of this concreting operation was inadequate. In particular, the quality of the steel framework was unsatisfactory, in that non-conformities were detected at the time of the inspection even though the authorisation to pour the concrete had been given. This finding also reveals inadequacies in the technical inspection carried out by the Bouygues/Quille/Baudin Chateaufort consortium and in the supervision of the activities conducted by EDF.

A. Demands for corrective actions

A.1. Non-conformities in the steel framework of plot no.2

During the visit to plot no.2, the inspectors and their technical support detected non-conformities in the steel framework *in situ*. Specifically, the pinning was not in accordance with the implementation plan INME 01343B, which defines the pinning arrangements for the nuclear

island raft. Several pinned overlaps between U-shaped bars were incorrectly positioned (pins missing from the lower part, distance and length of overlap outside tolerances). This observation was made when the concrete pouring operation had already begun. Corrective measures were immediately put into practice to make the steel framework conform.

This point gave rise to a notice of serious lapse.

This observation also reveals in this particular instance the inadequacy of the technical inspection carried out by the Bouygues/Quille/Baudin Chateauneuf consortium and of EDF's supervision of the construction activities.

This gave rise to two notices of serious infraction.

I request you to explain why the concrete pouring phase could have been commenced with a partially non-conforming steel framework. On this subject, you should send me both your analysis and that of the consortium. The latter should include in particular a summary of the technical inspection actions and the supervision carried out on the steel framework of plot 2. This summary will specify in particular the number of actions undertaken, their dates, the subjects concerned, the observations made and a comparison between these actions and the planned programme of technical inspection and supervision.

I request you to take the necessary measures to improve, in a significant and lasting way, the quality of your supervision of the work and the quality of the technical inspection conducted by the consortium on site.

Finally, I request you to send me your analysis as to the risks of comparable non-conformities having occurred in the steel framework of plots 4 and 5.

A.2. Inconsistency between reinforcement plan and work plan

In the course of the examination by the inspectors and their technical support of the reinforcement plans for the raft located under the future reactor building (HR) (ref. HR AR 07054 C, HR AR 07100 C), and the concreting work plan INME 01124 D, an inconsistency was noticed. Specifically, the aforementioned reinforcement plans show a cylindrical break in the concreting on the area situated under the HR, but with a shelf inserted before the prestressing gallery. However, the work plan INME 1124D mentions the concreting of the area under the HR in two layers, but with a shelf extending to the outside of the external wall (as carried out on plot 1.a).

I request you to explain the origin of this inconsistency with reference to the history of the evolution of these various documents. In this context, you should send me in particular the traceability records relating to the validation of the concreting work plan.

I request you also to specify the measures that you will implement to deal with this inconsistency, and more generally to check consistency between the documents relating to the construction of the Flamanville 3 reactor project.

Finally, I request you to indicate whether the concreting methodology for the area under HR (plots currently known as 1.a and 1.b) has been subject to changes, and why the methodology adopted on some 1,300MW sites (two central plots and an annular crown) was not adopted for the Flamanville 3 reactor.

A.3. Lifting of reservations concerning modification files

During the inspection, sampling of the modification files relating to plot no.2 (raft of the HK building) was carried out by the inspectors. It appears from this that some modification files are validated, but with reservations. However, the lifting of the reservations concerned is not systematically recorded (for example FA no.147).

I request you to complete your system for the management of non-conformity files and modification files so as to be able to track the lifting of associated reservations. You should send me the organisational memo which defines the procedure thus completed for managing the non-conformity files and modification files.

B. Additional information

B.1 Monitoring of corrective actions identified in modification files

A significant number of modification files is opened and some entail monitoring actions to be implemented subsequently (for example producing a topographic survey after construction). At present, you have no specific tool for the monitoring of these actions.

I request you to put in place a tool to enable the management of the monitoring actions identified in modification files. You will explain by way of reply the solution that you have adopted.

B.2 Monitoring of the reservations associated with supervisory visits

Upon examining the supervision files by means of the "GIPSI" IT tool, the inspectors noted that the file relating to plot no.2, area 13, referring to a under-coating had not been closed.

I request you to explain why this file was not closed when the concreting operations began, and the corrective measures that you will undertake to prevent the recurrence of this sort of situation.

B.3 Supervision of the placing of plates and inserts

The plates and inserts of the different plots of the raft undergo a positioning that is adjusted when they are put in place prior to concreting. However, during the inspection your representatives were unable to confirm the possible existence of a positioning inspection after concreting.

I request you to explain what provision is made for inspection of the positioning of inserts and plates after concreting, and to send me the document in which this is set out.

B.4 Operation of the concrete plants

When the inspectors visited concrete plant no.1, the monitoring values known as slump results showed two consecutive values of 200, for a permitted margin of 170 ± 30 . The observed results were thus at the upper limit of the authorised range. Nonetheless, there seem to have been no corrective steps undertaken to re-centre the observed value.

I request you to send me the slump result monitoring file for this concrete plant at the time of the concreting of plot no.2.

I request you to explain why corrective steps were not undertaken by the controller of the concrete plant when the test values were at the limit of the authorised values, in order to minimise the danger of their exceeding that range.

B.5 Kinetics of concreting of plot no.2 (HK)

The rectification of the non-conformities in the steel framework disrupted the beginning of the concreting of plot no.2 and probably altered the kinetics of the concreting.

I request you to send me the assessment of the concreting for this plot. This should in particular show the monitoring files for the concreting and your analysis of the progress of this concreting operation, taking account of the corrective measures brought to bear since the completion of plot 1.a.

C. Observations

C.1 Concrete sample storage area

During the inspectors' visit to the concrete sample storage area, two series of samples had just been poured (one for each concrete plant). However, there were as yet no labels to distinguish each lot. The inspectors consider that this practice creates a risk of confusion between the different samples.

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Please inform me of your observations on and responses to these points within no more than **one month**. I ask you to identify clearly the resulting commitments that you make and in each case to specify the timescale for their implementation.

Yours faithfully

On behalf of the President of the ASN, by delegation

Divisional head

Thomas HOUDRÉ